DOCUMENT RESUME

ED 352 882 HE 026 082

AUTHOR Cockey, Caroline
TITLE The Use of an Academic Discipline Model in Budgeting the State University of New York. New York Case Studies in Public Management, No. 2.
INSTITUTION New York Governor's Office of Employee Relations, Albany.; State Univ. of New York, Albany. Nelson A. Rockefeller Inst. of Government.
PUB DATE Sep 84
NOTE 28p.
PUB TYPE Reports - Descriptive (141) -- Guides - Non-Classroom Use (055)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Budgeting; Evaluation; Financial Needs; Full Time Equivalency; Full Time Students; Higher Education; Intellectual Disciplines; Mathematical Formulas; *Mathematical Models; Part Time Students; Public Colleges; *Resource Allocation; Teacher Student Ratio
IDENTIFIERS *State University of New York

ABSTRACT

This report examines New York State's experience with multi-element formulas in budgeting for the State University of New York, and considers some of the obstacles confronting scientific budgeting in a political environment. A specific budgeting formula (the Academic Discipline Model) is examined, its evolution and application discussed, and the measurement of its success outlined. The report concludes with several observations: (1) that formula budgeting carries no guarantees of rational decision making, the Academic Discipline Model being no exception; (2) that the expression of resource allocation via formulas permits constructive debate to ensue; and (3) that the quantified nature of the rationale focuses negotiations on discrete issues. It is noted that the Academic Discipline Model has been utilized for the past 6 years and has spawned competing models, thereby attesting to its usefulness as a mechanism for resolution of conflicts. (GLR)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

HE

ED352882

THE USE OF AN ACADEMIC DISCIPLINE MODEL IN BUDGETING THE STATE UNIVERSITY OF NEW YORK

Caroline Cockey

The Nelson A. Rockefeller College of Public Affairs and Policy
State University of New York at Albany

New York Case Studies in Public Management

A joint project of
The Nelson A. Rockefeller Institute of Government
State University of New York
and
The Governor's Office of Employee Relations

Number 2
September 1984

© The Rockefeller Institute of Government
and
The Governor's Office of Employee Relations

HE 026 082

"PERMISSION TO REPRODUCE THIS MATERIAL IN OTHER THAN PAPER COPY HAS BEEN GRANTED BY
Rockefeller Institute of Government
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)"

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

BEST COPY AVAILABLE

THE USE OF AN ACADEMIC DISCIPLINE MODEL IN BUDGETING THE STATE UNIVERSITY OF NEW YORK

Caroline Cockey

The Nelson A. Rockefeller College of Public Affairs and Policy
State University of New York at Albany

New York Case Studies in Public Management

A joint project of
The Nelson A. Rockefeller Institute of Government
State University of New York
and
The Governor's Office of Employee Relations

Number 2
September 1984

©The Rockefeller Institute of Government
and
The Governor's Office of Employee Relations

Abstract - **Can public budgeting be rationalized through the use of formulas? Or is it consigned forever to the murky status of "horse trading"? This study examines New York State's experience with multi-element formulas in budgeting for the State University, and considers some of the obstacles confronting "scientific budgeting" in a political environment.**

Introduction

"Scientific budgeting" has been the focus of a continuing discussion in the field of public administration.[1] Based on a desire to emulate private sector management practices and encouraged recently by the proliferation of computers, the "scientific" movement has had both its supporters and opponents. Opposing concepts in the argument have borne a variety of descriptive labels: scientific versus traditional; comprehensive rationality versus incrementalism; performance/program measurement versus line item, and others. Despite the differing terminology, the same question lies at the heart of each argument: do quantitative budgeting techniques work in a political environment?

Those who have introduced mathematical forms - the equation or formula - to the public sector are faced with the same skepticism as are all proponents of scientific budgeting. Yet, despite the controversy that formulas generate, they are widely used today in government budgeting. Although they are not usually applied in their original, rather unadulterated form, these formulas have provided a modicum of consensus and a quantifiable basis for discussion and negotiation. As Richard M. Meisinger puts it, "Inequality is more readily tolerated when open, accepted, 'objective' allocation rules are used."[2]

Devising applicable but politically acceptable budgeting formulas may be more of an art than a science. Historical events, individual actors, and constituents' opinions all go into the making of a formula; their influence is affected by the variables used and in the manner that those variables are combined. Determining which formula or set of formulas will "get the job done" is difficult when the budget examiner from a central budgeting office, such as the New York State Division of the Budget, has to accommodate a variety of parties, each having different conceptions of goals and policy objectives.

Creating formulas to be used as budgeting tools for public colleges and universities - those [putative] paragons of rationality - is no exception, especially when one is dealing with the largest public higher education system in the nation, the State University of New York (SUNY).

The Evolution Of The Formula

SUNY was created in 1948 to provide structural unity to the administration of 32 State-supported colleges. It has since grown, with the luck of prosperity and such highly supportive governors as Nelson Rockefeller, into a system encompassing 64 campuses, including: 4 University Centers; 2 independent Health Science Centers; 12 Colleges of Arts and Sciences; 6 Agricultural and Technical Colleges; 5 "Specialized" Colleges; 5 Statutory Colleges administered by Cornell and Alfred University; and 30 Community Colleges (run by local counties and receiving State aid for operating and capital costs). Total appropriations for the University as a whole for fiscal year 1983-84 were over $1.7 billion.[3]

Attaining that level of funding and determining its distribution among such varied institutions conjures up images of a Rubik's Cube. During periods of fiscal austerity the use of funds to build up a department at one campus may mean a reduction of funds for another campus. Thus, the choice of formulas that will aid the budget examiner in recommending appropriations to the Governor is a sensitive task. Changing the value of a single variable could result in the addition or subtraction of millions of dollars system-wide. The development and choice of budgeting formulas were tasks faced by the Education Examination Unit of the New York State Division of the Budget (DOB) during the 1970's, when it began to reconsider its methods for budgeting for the State University.

As is often the case in public management, external events are the impetus behind internal change. The economic growth of the 1960's, which the growth of the University system had paralleled, ended with a national recession in 1969. Public servants responsible for budgeting began to realize a simple truth: it is easier to recommend new funding than it is to constrict existing funding patterns. As Paul Veillette, Chief Budget Examiner and then head of DOB's Education Unit observed, "We discovered that when you're budgeting for austerity you have to know what you're doing more than when you're budgeting for affluence."[4] Members of

the Education Unit realized "tightening belts" meant the reconsideration and possible refinement of a major tool used to determine the allocation of funds to the University Centers and the Colleges of Arts and Sciences: the student/faculty ratio.

The student/faculty ratio - the measure used to determine the number of faculty budgeted to teach a given number of students - became a major tool for budgeting the campuses of the State University in the mid-1960's, when the need for consistency and uniformity in budgeting an institution employing over 30,000 people was recognized. The student/faculty ratio measure evolved from the performance budgeting concepts of the 1950's. Prior to 1965, the University was budgeted in a "line item" fashion; each faculty salary, each support employee salary, and each equipment purchase was itemized explicitly in the budget of each college and university. University administrators felt the need for greater flexibility, and DOB wanted to use more modern, "scientific" budgeting practices. In 1965, this convergence of interest led to a Memorandum of Understanding between the University and the State's then Director of the Budget, Dr. T. Norman Hurd, committing both parties to the development of budgeting models that would provide a technical foundation for the allocation of funds in lump sums. One of the results was the use of the student/faculty ratio to determine the Instructional and Departmental Research (I&DR) allocation for the Colleges of Arts and Sciences and the University Centers. (Subsequently, each SUNY campus received a single lump sum appropriation. Because the State Constitution requires budgets to be itemized, a court challenge by the State Comptroller in 1971 [settled out of court] caused campus appropriations to be made, henceforth, in seven lump sums, of which I&DR is one.) I&DR allocations are the largest components of the SUNY budgets and include funds not only for faculty but for support staff and related equipment as well. After 1965, the student/faculty ratio would be used to determine the number of faculty to be budgeted for each campus, and corollary standards were to be developed to determine the funding for support staff and equipment per faculty member.

Student/faculty ratios were initially developed loosely, based on negotiations between the University and DOB.[5] The same ratio was applied to all campuses within given "clusters" (e.g., "University Centers" or "College of Arts and Science") regardless of how students at those campuses were distributed among academic

disciplines and levels of instruction. This was tolerable when the University was expanding and richly funded, though the use of a "universal" student/faculty ratio concealed inequities. Austerity, however, demanded fine tuning. A more sophisticated tool was needed that would equitably distribute the effects of belt tightening among a wide variety of campus budgets.

The first step taken to refine the student/faculty ratio tool was to acknowledge the need for different student/faculty ratios at different levels of academic instruction. The Education Unit recognized this distinction by establishing different student/faculty ratios for each of four academic levels. Campus I&DR budgets, after 1972, would be determined on such a basis: lower division (freshman and sophomore) classes would have a ratio of 20 students to 1 faculty member; upper division (junior and senior) classes would have a ratio of 18 students to 1 faculty member; graduate level I (master's level) would have a ratio of 12 students to 1 faculty member and graduate level II (doctoral level) would have a ratio of 8 students to 1 faculty member.

While the Education Unit had arrived at its new technique empirically, it soon initiated research on the use of student/faculty ratios throughout the nation to provide data to assess its decision and to explore ideas for other methods of budgeting higher education in times of austerity. The result was the "Survey of Use of Student/Faculty Ratios for Budgeting Purposes in Higher Education," a report prepared by the Organization and Management Unit of DOB.[6]

The report was based on a survey of heads of state budget offices, top administrators of a variety of colleges and universities across the nation, heads of national education associations and state boards of higher education to "obtain an understanding of how student/faculty ratios are used and to evaluate existing alternative budgeting systems."[7] Completed in the Fall of 1974, the study explores the nature of the student/faculty ratios as budgeting tools, and contains some useful observations about budgeting formulas in general. Among them are:

Input data used in student/faculty budgeting formulas are susceptible to manipulation - Manipulation is almost irresistible when the institutions providing the information are also the institutions for which a budget is being developed. A case in point is the determination of the number of students attending a given campus.

This figure is the "kernel" of the student/faculty ratio formula, for the estimated level of faculty staffing that is needed (and, hence, the I&DR allocation) is dependent upon this calculation. For budgeting purposes, determining that number is more than a matter of simple counting. SUNY's Central Administration and DOB, prior to 1977, determined student/faculty ratios based on "Full Time Equivalent Students" (FTEs). The total number of FTEs was determined by dividing the total credit hours taken at a campus by a set number of credits that constituted a "full-time course load" (usually 15 credits for undergraduate and 12 for graduate-level courses). It is, therefore, to a campus's advantage to have a large number of total credit hours taken by each student. If the institution inflates the number of credit hours given per course, it will also create a greater number of FTEs (since the full-time course load figure is a constant) without an increase in enrollment. An artificial need for more faculty would be created and funding would increase for that campus.

Budget examiners prefer simpler formulas than do members of the academic community - Because they have to distribute funds among such a variety of institutions and programs, budget examiners would rather use fewer factors to determine ratios during the budget formulation process, and then subsequently allow a campus flexibility to reallocate faculty during the budget execution phase. This stance also reflects the budget examiner's reluctance to get involved with factors that touch upon "academic issues." Frank Walter, a Principal Budget Examiner in DOB whose current responsibilities include developing the student/faculty ratio model for SUNY budgets, explained that many of the problems he deals with are considered sacrosanct by members of the academic community, who are justifiably concerned with maintaining quality education.[8] At the same time, those elements which compose "quality education" are rarely defined or agreed upon within or outside of the higher education community. They certainly are not readily adapted to formula budgeting.

There is no "ideal" student/faculty ratio - There is no agreement among budget examiners or academicians on the "best" class sizes for teaching or learning purposes. Paul Veillette is fond of quoting Ernest Boyer, former Chancellor of the State University: "The first question I'm going to ask St. Peter when I get to the Pearly Gates is, What is the ideal student/faculty ratio?" Complicating the matter further is the perspective of budget examiners on budgeting through student/faculty

ratios. As Veillette explained, whether there are 20 students in a classroom or 21 probably makes little difference in the quality of learning experienced by the student; a difference develops only with widely differing ratios. However, he added, budgeting based on a set class size of 20, applied to all campuses, may mean spending millions of dollars more than if the class size is set at 21. For the budget examiner, then, minor adjustments in student/faculty ratios mean major differences in the levels of funding, while the actual quality of education may be unaffected. As a consequence of the inability of academicians to be more precise on optimal class size, budget examiners are given considerable latitude in constructing funding formulas.

Although the report of DOB's Organization and Management Unit was careful to note the limitations of using student/faculty ratios in budgeting, it recommended continued use of this tool to be supplemented by better information, enabling budget examiners to monitor trends and changes in the development of the various campuses. While DOB had earlier refined the tool to address needs at four different academic levels, the report helped to evaluate the potential for further refinement. In the five years following the report, events, both internal and external to the University system, demanded that that potential be further explored.

The State's fiscal crisis of 1975-76 and changes within the SUNY system began to call into question the desirability of using only four different student/faculty ratios to develop recommended I&DR allocations. Enrollment patterns began to change dramatically in the early 1970's, as students began to set their sights on the job market. "Saleability" became the prime criterion when choosing a major. Business departments, for example, began to function at student/faculty ratios as high as 60 to 1, due to unpredicted heavy enrollments. Science and engineering programs were experiencing the same phenomenon. Conversely, education departments, of which SUNY had many, were experiencing severe reductions in enrollment. Their student/faculty ratios were falling considerably (being "enriched"), as were those of the liberal arts departments. The changes affected the various campuses differently. Stony Brook, the University Center located on Long Island, began to shift its program structure to accommodate students who were interested in the hard sciences and technical fields. An accepted canon in academic circles is that science courses, especially

those requiring labs, function better with fewer students per class than courses in liberal arts or business. Meanwhile, SUNY at Albany, which was more oriented toward the "soft sciences," was experiencing lower enrollments in its traditionally strong education department (it was formerly a teachers' college), while the business department began to burst at the seams with students. Yet, both campuses were budgeted by academic level only (20:18:12:8), ignoring the different configurations of their academic disciplines.

To complicate matters further at a time when DOB was reassessing its budgeting methodology to explore ways of incorporating both academic discipline and academic level into one budgeting model, the City University of New York began to loom large as a potential ward of the State. In 1975, the City of New York entered a fiscal crisis. In response, it severely cut the budgets of many of its institutions and agencies, including the City University of New York (CUNY).

CUNY is the third largest publicly supported University system in the nation. It has an unusual structure; along with its ten campuses, seven of which offer a wide range of undergraduate and graduate degrees through the master's level, CUNY maintains a University Center and Graduate School through which its doctorates are earned, and a closely integrated group of community colleges. During the City's crisis, the City University lost almost a third of its enrollment (over 50,000 students) and dismissed a larger number of its faculty.

The possibility of New York State fully funding CUNY began to be explored. The State by then had provided 50 percent of the net operating budget of the University. In 1979, Governor Hugh Carey signed into law a bill requiring the State gradually to assume the complete tax levy supporting CUNY's senior colleges. The full takeover of operating and capital costs was scheduled to occur by 1983, potentially saving the City $70 million per year.[9]

Even before the takeover began, discussion arose concerning the methods DOB would use to budget CUNY and SUNY in a way that would be equitable to both. The issue became known as the parity-equity problem, and it called into question the ability of a formula based on student/faculty ratios to solve the problems of two rapidly changing educational systems. Although CUNY and SUNY are both large systems, they differ in many respects. Seth Honeyman, Principal

Budget Examiner currently in charge of the CUNY budget, explained that these differences have implications for the student/faculty ratios applied to the budgeting of each.[10] The City University, for example, draws most of its students from its immediate urban area. While some of New York City's high schools are among the best in the nation, Honeyman explained, many inner city schools do not provide students with the skills that suburban school districts normally provide. To enable their students to receive a college education on a par with other universities, CUNY provides a number of remedial programs. CUNY administrators claim that the need for smaller classes to provide adequate remedial programs should be a major consideration when budgeting for the university.

Honeyman also explained that organizational differences make it difficulty to compare CUNY and SUNY for budgeting purposes. Because of the unusual organization of CUNY created by its University Center, there is no institution in SUNY that invites easy comparison with any of CUNY's institutions. Whether the same formula could be applied to two structurally different university systems had become a point of contention.

Different enrollment trends at the two institutions also made it difficult to budget in a way that would be perceived by both parties as equitable. The severe drop in enrollment at CUNY meant fewer students in classes and, therefore, a "richer" student/faculty ratio. SUNY, on the other hand, was beginning to experience a period of over-enrollment. It had a greater number of students in its classes than the number for which it was budgeting, resulting in a "leaner" actual student/faculty ratio. On the surface, any budgeting methodology that would attempt to provide "parity" or reduce the difference in staffing levels between the two university systems would mean either decreasing the number of faculty budgeted at CUNY or increasing the number of faculty budgeted at SUNY. Both solutions had obvious political and budgetary ramifications.

The Education Unit's task in the late 1970's was, therefore, to develop a budgeting formula using student/faculty ratios that would continue to address the problems and recommendations cited in the Organization and Management Unit's report; reallocate faculty among a programmatically changing State University; distribute funds fairly among two very different higher education systems; and permit effective budgeting in a period of continuing fiscal austerity. What emerged

was the "Academic Discipline Approach," a set of formulas applied to SUNY prior to State assumption of full budgetary responsibility for CUNY.

How The Formula Works

The Academic Discipline Approach is a method of applying the student/faculty ratio concept to budgeting while accounting for the different needs of different academic levels and different academic disciplines. Recommended levels of staffing are formulated according to the four academic levels described previously (lower division, upper division, graduate level one, and graduate level two) and ten academic disciplines. Thus, a "Forty Cell Matrix," with a different student/faculty ratio filling each cell, is created.

The ten different academic disciplines were originally identified by the State Education Department at the request of DOB. Veillette explained that the Education Department was the wisest choice to determine the disciplines since the Department had ready access to relevant information and to advice from national education associations, yet was not politically affected by the outcome of the research. He added, "We didn't have to follow their advice if we didn't want to."

The "Forty Cell Matrix," depicting the distinction between the ten academic disciplines, is illustrated in Table 1.

Table 1

	Upper Division	Lower Division	Graduate Level 1	Graduate Level 2
Biological Sciences				
Business & Management				
Education				
Fine & Applied Arts				
Languages & Letters				
Mathematics & Computer Sciences				
Physical Sciences & Engineering				
Psychology				
Social Sciences				
Other				

The Academic Discipline Approach was initially used only when budgeting for the 4 University Centers and the 12 arts and sciences colleges. The model was not applied to the health science centers, the "specialized colleges" (such as the School of Optometry and the Maritime College) or the 6 agricultural and technical colleges. It was felt that the special nature of the fields taught by these institutions demanded specially tailored methods to determine their ratios. Many of the technical programs undertaken by these institutions demand the use of a predetermined "ideal" student/faculty ratios. For example, schools of nursing maintain that their national professional association requires a student/faculty ratio for nursing of ten to one.

The methods and factors used to determine the student/faculty ratios that fill each of the forty cells of the matrix have varied somewhat since the model's inception in 1977.

From the outset, it was decided that the model should be based on "actual" student/faculty ratios - that is, the ratios the colleges and universities were currently functioning under and had functioned under in the recent past. As Veillette explained, it is much more practical to develop recommendations based on ratios actually in use rather than on "ideal" or "normative" ones, which require controversial judgments. One would have to be agreed upon (or at least tolerated) by all concerned parties and that agreement seemed hardly likely. The so-called "branch" method, which assumes the status quo to be a reflect n of consensus, seemed to be a practical alternative in order to minimize conflict. The I&DR allocations recommended, therefore, would be developed by using the ratios used in the past by campuses in distributing their faculty during the execution of the budget, since these ratios would be indicative of campus views of the best student/faculty ratios under existing fiscal conditions.

The figures used in determining these "actual" ratios come from the "Course and Section Analysis (CASA) Report," a product of the Office of Institutional Research and Analytical Studies of the State University. The yearly CASA report contains a plethora of facts and figures provided by thirty State University campuses (community colleges do not participate in the development of the CASA Report). A variety of tables and graphs are compiled that trace faculty workload

trends and enumerate "Selected Cost Factors" for the various colleges and universities. (For a definition of the types of figures used in the CASA Report and illustrations of tables and graphs see the Appendix.)

The first step in calculating the forty different student/faculty ratios is the determination of the "student" portion of the ratio (actually the numerator, if the ratio is viewed as a fraction) using the figures supplied in the CASA report. While "Full Time Equivalent" students (FTEs) was used prior to 1977-78 (derived, as explained earlier, by taking the total number of credit hours taught at a campus and dividing by a standard number of credits) this widely-used method had been open to manipulation everywhere. In response to this problem DOB developed the alternative "Equated Student" measure.

When using the Equated Student method, a student taking the minimum number of credits for a full academic load (usually 12 credits for undergraduates) is counted as one full time student. Part-time student hours are compensated for by (a) dividing the total full-time student hours by the number of full time students, arriving at an average full-time student figure and then by (b) dividing this average into the total number of part-time student hours taken. The result, the part-time equated student figure is added to the number of full-time students attending the campus to arrive at the total number of full-time equated students. The method is illustrated mathematically in Table 2.

Table 2

$$\text{Average Full-Time Student Credit hours} = \frac{\text{Total Credit Hours Taken By All Full-Time Students}}{\text{Number of Full-Time Students}}$$

$$\text{Part-Time Equated Students} = \frac{\text{Total Credit Hours Taken By All Part-Time Students}}{\text{Average Full-Time Student Credit Hours}}$$

Number of Part-Time (P-T) Equated Students + Number of Full-Time (F-T) Students Equals Number of Full-time Equated Students

The equated student method prevents manipulation through credit inflation although any formula approach to budgeting is subject to manipulation. It appears that the Division of the Budget is prepared to change its approach to counting students in the future in response to new challenges of this sort. The total credit hours taken by full-time students would increase if credits were inflated, thereby making the denominator larger in the second equation shown in Table 2, while the numerator (using the 12-credit standard) would remain constant. The result would be a decrease in the number of full-time equated students, and the campus's I&DR allocation theoretically would drop. The equated student method not only negates the effects of credit inflation but is also consistent with the University's tuition policy, since all full-time students, whether taking the minimum 12 credits or a greater number, pay the same tuition.

What is left to determine is the faculty portion of the ratio. Both DOB and the University use the "Full Time Equivalent" (FTE) faculty concept. The FTE faculty figure (like the FTE student and Equated Student figures) is a "workload" measure that allows several part-time individuals to be counted as a specific number of full-time individuals e.g., two faculty members carrying half the course load of the average faculty member will be counted as one FTE faculty. The FTE faculty comprises the denominator portion of the ratio.

After the methods of calculating the student and faculty figures had been decided, DOB had to face another issue. Should a given year's student/faculty ratios be based solely on current figures, or should ratios from the immediately preceding years also be used? The argument in favor of the latter approach has been that it would phase in faculty reductions on campuses with declining enrollments and would similarly phase in new faculty hires on campuses with sharply increasing enrollments, making hiring of quality faculty manageable. Further, this symmetrical approach would mute the effects of enrollment fluctuations, encouraging the stability needed to preserve academic quality.

Although methods for determining the "actual" ratios have varied from year to year, for the past three budgets (Fiscal Years 1982-83, 1983-84, and 1984-85) DOB has used a three-year "weighted" average. The equated student figure for the first year is multiplied by .2 and added to the equated student figure for the next

year, which is multiplied by .3. Both are then added to the equated student figure of the latest year, which is multiplied by .5, to arrive at a three-year weighted figure for equated students. The same weighting formula is applied to the three FTE faculty figures. The FTE faculty figure is then divided into the equated student figure to arrive at the recommended student/faculty ratio (for a mathematical illustration, see Table 3, below). This computation is performed for each of the ten academic disciplines at each of the four academic levels, to fill in the forty cells of the matrix.

Table 3

A = Equated Students, Year 1 D = FTE Faculty, Year 1

B = Equated Students, Year 2 E = FTE Faculty, Year 2

C = Equated Students, Year 3 F = FTE Faculty, Year 3

$$\text{S/F Ratio, Year 4} = \frac{A(.2) + B(.3) + C(.5)}{D(.2) + E(.3) + F(.5)}$$

The final question addressed by DOB was whether this operation should be performed for each separate institution, or whether one matrix (derived from the combined figures from every institution) should be applied to all the centers and colleges.

DOB addressed this issue with its "cluster" plan. One forty cell matrix is applied to the "cluster" of 4 University Centers (derived from the combined figures those campuses supplied in the CASA Report) and another forty cell matrix is applied to the "cluster" of 12 colleges of arts and sciences (also derived from the combined figures those colleges supplied). In effect, this approach utilized the combined judgments on student/faculty ratios of campuses within a cluster and also introduced an equalizing standard between and among campuses, modifying extremes toward a norm.

Application of the Model

A question remained: once a game plan is set up, how strictly should the rules be followed? If, for example, a strict application of rules would mean firing five faculty members at a particular campus, should such a reduction be implemented? At this point, policy overrules formulas. A State policy of "no firings" would supersede the formula.

Frank Walter, of DOB, illustrates the dilemma as follows: The College of Arts and Sciences at Brockport has experienced a substantial drop in enrollment, but has not lost faculty at an equivalent rate. As a result, the model would generate numbers indicating a need for a large reduction in force. But can the campus absorb such a reduction without severe damage to its programs? "We have to be sensitive to the overall impact on a campus — not only on faculty, but on maintenance and student services," Walter said. "We have to soften the blows."

On the other hand, if application of the model indicates the need for substantial faculty hirings on certain campuses, then strict application of the formula could be in direct violation of State budgetary policy objectives. For example, when the model was first implemented it brought attention to the need for a sizable increase in faculty at the Stony Brook campus. Hiring a large number of faculty (or any other staff) in one year, however, would have contradicted general State policy in a period of acute fiscal austerity.

In short, whether operation of the formula dictates contraction or expansion of faculty, it is not allowed to operate freely. Policy governs; technique is not permitted to triumph over purpose.

Walter said a "set of governors" is usually used to guide implementation of the Academic Discipline Model. "One year we might change faculty levels no more than 3 percent," Walter said, "but another year we wouldn't change them by any more than 5 percent." However, Walter explained, if a campus requests a faculty reduction greater than the model indicates, DOB will budget the campus at the level of the requested reduction. And if the model indicates a campus should be staffed by more faculty than the campus has requested, the campus will only receive funds for the number requested.

To understand fully the implementation of the model, it is important to realize that while the number of faculty recommended is the most significant determinant of the amount of the I&DR appropriation, the appropriation is in "lump sum" form. In executing the appropriation (once passed by the Legislature), the University is not bound to employ the exact number of faculty for whom funds have been budgeted. It could use funds budgeted for faculty to buy equipment (typewriters, etc.) or to employ support staff. Nor is it bound to function under the ratios DOB developed to formulate funding recommendations. It could, for example, use funds based on a calculated need for more humanities faculty to hire more business faculty. But a campus must realize that because the model is historically based, its decisions to redistribute faculty lines will have implications for future budgets.

The City University has its own special problems with application of the formula. As discussed earlier, there are no SUNY institutions that are directly comparable to CUNY's institutions. Disagreement, therefore, arose as to the nature of the matrix which should be applied to CUNY campuses. Statistically, one of CUNY's "Big Four" (City College of New York [CCNY], Hunter, Brooklyn, or Queens) might be more closely analogous to the State University's Colleges of Arts and Sciences than to its University Centers. But, for reputation's sake, the administrators of the CUNY campus might prefer that their campus be compared to a University Center, even if some loss of funds results. "In higher education," Veillette simplified, "perception is everything." The solution was to call the four-year colleges at CUNY that give out master's degrees "Comprehensive Colleges" and to develop a "forty cell matrix" for them based on a cluster combination of SUNY's four-year arts and sciences colleges (except Purchase, Old Westbury, and Empire State) and the two University Centers at Albany and Binghamton. It was hoped that this approach would give CUNY's Big Four unique identities while concurrently resolving some of the parity-equity issues between SUNY and CUNY.

Measuring The Formula's Success

The acid test of any budgeting formula is the degree to which it creates the possibility of consensus among the actors involved. Initially, the Academic Discipline approach was well received because, among other reasons, it offered an

innovative response to changing economic conditions, represented a distinct improvement in measuring faculty workload, and (a bit later) helped cope with the parity-equity issue between SUNY and CUNY. Problems soon emerged, however.

The State University Central Administration, while pleased to be working with a budgeting model that is more refined than its predecessor, has had some problems with specifics in the DOB model. Consequently, it has modified DOB's "Forty Cell Matrix" by utilizing "normative" student/faculty ratios instead of DOB's "actual," in some cases, and basing its budget requests to DOB on the revised model. The revision uses FTEs instead of Equated Students in computations.

In part, the University prefers to use its revision because, as William Anslow, SUNY's Associate Vice Chancellor of Finance and Business explained, DOB's approach is "driven by past enrollments."[11] By using a three-year weighted average to determine student/faculty ratios, DOB disadvantages campuses which over enroll. When a campus admits students beyond the level for which it is budgeted, it will have to function in the future under the higher ratios created in the year it over enrolled. And because ratios are determined for a cluster as a whole, even campuses that did not over enroll are penalized.

Anslow also explained that DOB's model is not sensitive to changes in program demand. If a business department, for example, gradually enrolls more students, an "historical" model (one based on "actual" rather than "ideal" ratios) implicitly assumes the department can function well under the higher ratios engendered. "You can't take history in and of itself and assume you have the right answer," Anslow said.

The differences between DOB and the University are far from non-negotiable, however. Anslow said he has been working with Frank Walter for the past two years, on and off, toward settlement of differences. The two models serve as frameworks for discussion.

CUNY's difficulties with the model also arise, in part, from the "historical" nature of its approach. Although CUNY's former Chancellor, Robert Kibbee, initially praised DOB's approach to budgeting in public statements, his disenchantment developed later because of CUNY's special problems. Joseph

Vivona, CUNY's Deputy Vice Chancellor for Management and Budget, voiced his objections to what he believes to be the inflexibility of the model.[12] The University, he claims, still has not been able to invest in the staffing needed for remedial programs; nor does the model consider the limitations or the age of the facilities being used for classroom instruction. "It does no good to budget a business class at a level of forty to one, when the classrooms may not hold more than 20 students," he said. But Vivona's major objection is to the use of such techniques as Frank Walter's "set of governors." "When it suits them, Vivona said, "they don't use it."

The Legislature, which is sensitive to the concerns of SUNY and CUNY, has its own problems with the model. Daryl Kade, an Associate Legislative Budget Analyst working for the Assembly's Ways and Means Committee, explained that the "historical" approach incorporated in the model not only punishes schools for over enrolling in the past but has also provided DOB and the Governor with a convenient mathematical means of justifying cuts.[13] Many legislators feel the model is more likely to be used to justify reductions in staff than to provide special consideration for high quality academic programs. Echoing Vivona, she said, "Legislators recognize the silliness of using a model and then not using a model." While CUNY objects to the use of "governors" because their use translates into a means of applying "across the board" cuts, the Legislature's central concern is to avoid layoffs. The faculty members of the public colleges across the State (all of them unionized) are constituents of members of the Legislature, as are the students who attend those institutions. Public employee unions are potent forces. This reality has been the impetus behind the restoration of funds during the past several years. "In the Greenbook (the statement of legislative intent)," Kade said, "they don't talk about staffing ratios or models — they talk about layoffs."

Conclusion and Discussion Questions

Generally speaking, formula budgeting carries no guarantees of rational decision-making, and the Academic Discipline Model is no exception to this rule. One's view of rationality is too often determined by underlying values and deeply-held aspirations. Yet, as noted in the introduction to this case, the expression of resource allocation via formulas permits constructive debate to ensue. The quantified nature of the rationale focuses negotiations on discrete issues. The fact

that the Division of the Budget's Academic Discipline Model has survived and been utilized for over a half-dozen years — and has spawned competing models — attests to its usefulness as a mechanism for resolution of conflicts.

It is no accident that many of the complex and controversial programs in the State budget are formula-driven; e.g., State aid to elementary and secondary education, aid to community colleges, and Medicaid. Typically, the formulas strive for equity among articulate constituencies within the limits of available resources. For DOB's Academic Discipline Model to be successful it need not prevail in budgetary debates. It need merely establish the framework for reasoned discussion.

1. The Division of the Budget alleges it is impossible for it to define ideal student/faculty ratios in formulating its model. Should it, therefore, defer to the ratios in the normative model of the University, since presumably the determination of optimum class size falls within the University's area of expertise?

2. How is an allocation formula best developed? Executed? Since one purpose of the Academic Discipline Model is to provide a framework for developing consensus among contending parties, should the Legislature be a partner of the Executive in developing the Model before introduction of the Executive Budget by the Governor to the Legislature each year?

3. Is it ethical for DOB to change its method of counting students (FTEs to ESs) in response to its perception of abuse in computing FTEs, or should it have attempted to rectify the problem at the source and retained the FTE measure?

4. If all quantitive methods can be manipulated in some way, are there ways to minimize such effects? Statistical watchdog groups? Professionalism? Other?

Notes

1. For an early discussion of the first major attempt at scientific budgeting, performance budgeting, see Jesse Burkhead, Government Budget (New York: John Wiley & Sons, Inc., 1956), pp. 133-181. For later developments, see Allen Schick, "The Road to PPB: The Stages of Budget Reform," Public Administration Review, December 1966, pp. 243-258; Rodney H. Brady, "MBO Goes to Work in the Public Sector," Harvard Business Review, March-April 1973; and Peter A. Pyhrr, "The Zero-Base Approach to Government Budgeting," Public Administration Review, January-February 1977.

2. Richard J. Meisinger, State Budgeting for Higher Education: The Uses of Formulas, Center for Research and Development in Higher Education, University of California at Berkeley, 1976, p. 8.

3. The New York State Executive Budget, 1983-1984, p. 335.

4. Interview with Paul Veillette, July 1983, Chief Budget Examiner for Education from 1970-1982.

5. The DOB's Chief Budget Examiner responsible for higher education budgeting at that time was John Van Laak, who was succeeded by Dr. Donald Axelrod (1966-1970), recently retired as a faculty member at SUNY Albany.

6. Survey of Use of Student-Faculty Ratios for Budgeting Purposes in Higher Education, Organization and Management Unit, New York State Division of the Budget, October 1974.

7. Ibid, p. i.

8. Interview with Frank Walter, Principal Budget Examiner, DOB Education Unit, August 1983.

9. The New York Times, June 28, 1978, Section II, P. 1.

10. Interview with Seth Honeyman, Principal Budget Examiner, DOB Education Unit, August 1983.

11. Interview with William Anslow, Associate Chancellor for Finance and Business, Central Administration, State University of New York, September 1983.

12. Interview with Joseph Vivona, Deputy Vice Chancellor for Management and Budget, City University of New York, November 1983.

13. Interview with Daryl Kade, Associate Legislative Budget Analyst, Assembly Ways and Means Committee, New York State Legislature, September 1983.

14. Interview with Dr. Kenneth Levison, Head of Professional Staffing and Career Development, New York State Division of the Budget; formerly Senior Budget Examiner, DOB's Education Unit, assigned to SUNY and CUNY budgets. December 1983. He was of the model and in defining the nature of unresolved issues.

Appendix

Selected Data From
SUNY Course & Section Analysis
1981

Only the first ten categories are used to summarize the activity of the senior institutions. A different grouping of the discipline specialties is used to summarize the activity of the Agricultural and Technical Colleges, necessitating the use of all nineteen categories.

The National Center for Education Statistics (NCES) released a new academic program taxonomy in February 1981: A Classification of Instructional Programs. This taxonomy is more comprehensive than the old HEGIS taxonomy and is more descriptive of the activities of all levels of education. We plan to implement the new taxonomy in CASA for use by the colleges in coding their courses. This project will have long-term implications relative to the computer resources necessary to change our reports, including the STATISTICAL ABSTRACTS.

ENROLLMENT: Enrollment is the number of students in the sections of a course. Anyone registered for credit, regardless of full-time or part-time status, is included. Auditors and post-doctoral enrollees are excluded.

FULL-TIME EQUIVALENT WORKLOAD (FTE WKLD): FTE workload is a unit of measure derived from student credit hours. Generally, one FTE workload is equivalent to 15 student credit hours in undergraduate courses, or 12 student credit hours in graduate courses. Professional and doctoral students are subject to special detailed definitions.

FULL TIME EQUIVALENT FACULTY (FTE FACULTY): Like full-time equivalent workload, FTE faculty is a means of translating an amount of activity into a term that suggests a number of individuals taking part in that activity as if it were their only activity. This concept is particularly useful in allowing several part-time individuals to be equated to an equivalent number of full-time individuals. The full-time or part-time status of faculty is generally defined by contract and for purposes here is extracted from appropriate personnel records. Special procedures exist for inputting an FTE for temporary service faculty, contributed service staff, etc.

INSTRUCTION TYPE: The primary instructional mode of a section is identified and the section is classified from the following: lecture, seminar, recitation, laboratory or activity, tutorial, independent study and programmed instruction. A section is classified as using programmed type of instruction if there is generally no instructor expected, scheduled, or present, e.g., television courses, computer-assisted instruction, etc. A section has a single type of instruction but a course may be a composite of several types of instruction. Each time the mode of instruction changes, a new section is assigned to the course.

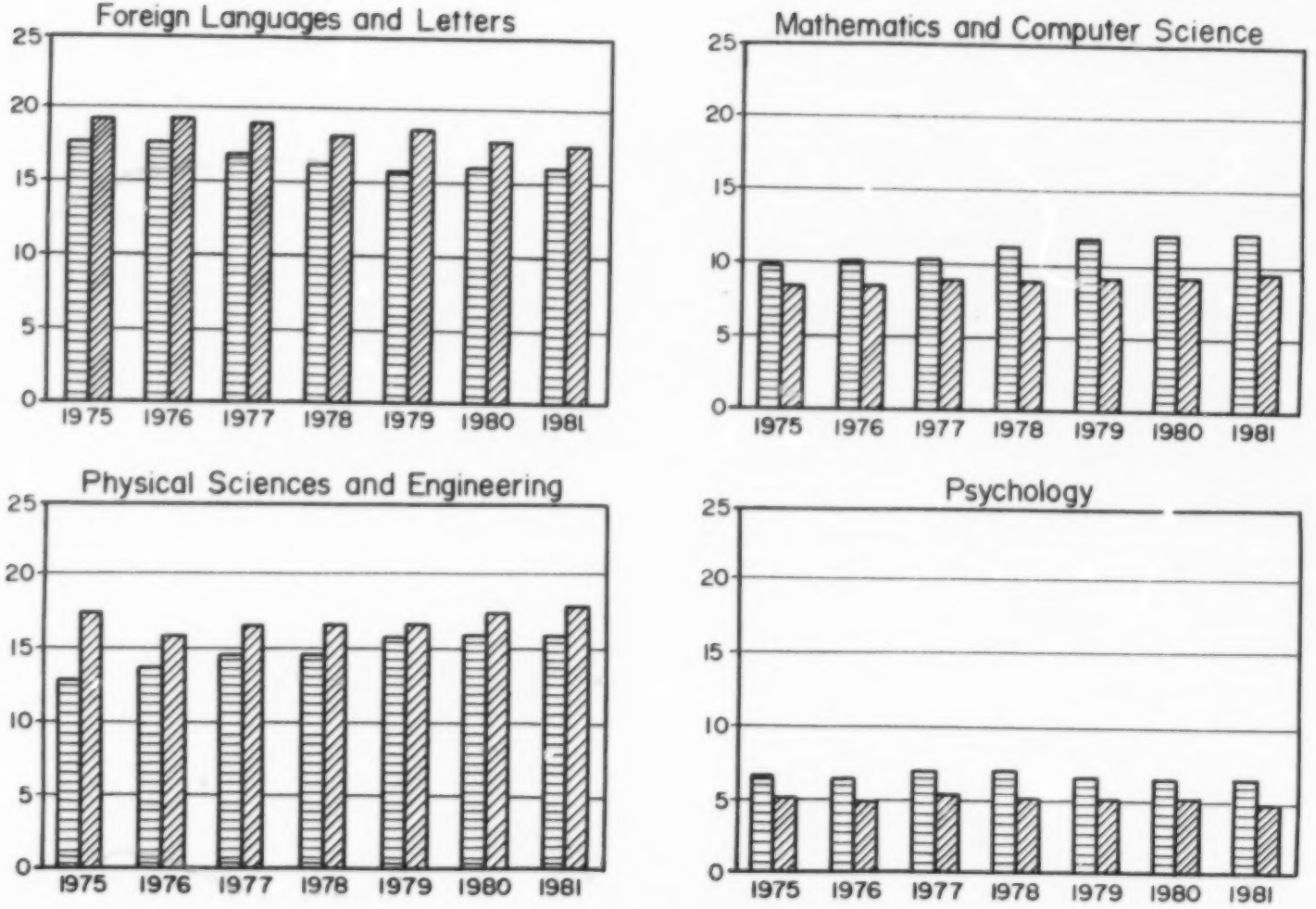
SECTION: A section is a group of students assembled for instruction in regularly required meetings wherein the instructional mode is fixed. For example, a group of students meeting on Monday, Wednesday, and Friday for lectures is a single section. A separate section is identified for each different type of instruction even though the same group of students is involved. Therefore, a single group of students meeting Monday and Wednesday for lectures and on Friday for a laboratory constitute two sections. A section is identified as having a single instructional mode. When the instructional mode is tutorial, each student is regarded as a separate section because the instructor meets with individual students separately.

UNIT COST: Three types of unit costs are defined to assist in making cost comparisons for various purposes. The salary unit cost is conveniently thought of as the annual faculty salary divided by the number of credit hours students are awarded toward graduation for participation in the courses. The support unit cost generally refers to the remaining departmental expenditures after instructional salaries are removed. Support costs are unitized by the same divisor, i.e., student credit hours. Unit costs for the Instruction and Departmental Research teaching department are obtained from addition of the salary and support unit costs.

WEEKLY FACULTY CONTACT HOURS (WFCOH): The weekly faculty contact hours for a staff member are the number of hours in a week the staff member meets with classes in a formal instructional environment or in credit-bearing tutorial sessions.

WEEKLY STUDENT CONTACT HOURS (WSCOH): The weekly students contact hours for a course are the number of hours all students enrolled in the course spend in a formal instructional environment or in credit-bearing tutorial sessions.

State University of New York
University Centers
Percent of Total Full-Time Equivalents for Students and Teachers Represented in Selected Academic Disciplines
1975-1981



These graphs compare, over a seven year period of time, for each of four academic disciplines found at all of SUNY's University Centers, the percentage of total Full-Time Equivalents (FTE's) for either students ("workload") or teachers ("faculty") borne by students assigned to, or faculty teaching in, the identified academic discipline group.

SELECTED COST FACTORS FOR ALL DISCIPLINES, ALL COURSES
FULL I&DR COSTS PER STUDENT CREDIT HOUR[1]

Institution	SCRH	SALARY PER SCRH	DIRECT SUPPORT PER SCRH	DIRECT I&DR PER SCRH	OTHER I&DR SUPPORT PER SCRH	TOTAL I&DR PER SCRH
State-operated/funded institutions	2,367,576	86.06	27.85	113.91	12.69	126.60
University Centers	820,305	98.77	39.97	138.74	17.12	155.86
Albany	205,505	99.72	37.52	137.24	18.66	155.90
Binghamton	154,058	90.28	29.83	120.11	15.82	135.93
Buffalo	287,637	94.16	42.90	137.07	10.05	147.12
Stony Brook	173,105	112.87	47.01	159.88	28.20	188.08
University Colleges	1,014,386	80.78	17.89	98.67	11.22	109.89
Brockport	100,800	100.95	14.40	115.35	18.89	134.24
Buffalo	146,207	79.37	14.22	93.59	9.44	103.03
Cortland	86,879	72.84	14.99	87.84	13.88	101.72
Empire State	NO DATA AVAILABLE					
Fredonia	74,485	79.38	19.00	98.38	6.82	105.20
Geneseo	79,604	76.66	19.80	96.46	10.35	106.81
New Paltz	83,514	87.99	16.37	104.36	12.78	117.14
Old Westbury	42,188	72.83	16.44	89.27	6.35	95.62
Oneonta	90,397	79.14	22.24	101.38	10.17	111.55
Oswego	108,094	78.84	15.47	94.31	14.12	108.43
Plattsburgh	88,082	78.28	20.06	98.34	9.79	108.13
Potsdam	70,855	74.41	23.72	98.13	7.84	105.97
Purchase	43,292	82.12	26.20	108.32	8.48	116.80
Health Sciences Center	12,892	127.79	68.62	196.41	17.56	213.97
Buffalo	NO DATA AVAILABLE					
Downstate	NO DATA AVAILABLE					
Stony Brook	12,892	127.79	68.62	196.41	17.56	213.97
Upstate	NO DATA AVAILABLE					
Specialized Colleges	70,996	90.55	29.35	119.90	21.63	141.53
Environmental Science and Forestry	20,294	153.86	49.20	203.06	38.29	241.35
Maritime	17,217	80.90	28.02	108.92	6.93	115.85
Optometry	NO DATA AVAILABLE					
Technology at Utica/Rome	33,485	57.13	18.01	75.15	19.09	94.24
Statutory Colleges	79,638	107.41	74.47	181.88	1.72	183.60
Ceramics	9,441	81.45	78.54	159.99	14.51	174.50
Agriculture and Life Sciences	49,382	104.27	78.46	182.73	-	182.73
Human Ecology	13,035	142.50	86.93	229.43	-	229.43
Industrial and Labor Relations	7,780	100.01	23.40	123.41	-	123.41
Veterinary Medicine	NO DATA AVAILABLE					
Agricultural and Technical Colleges	369,359	65.39	16.54	81.93	7.38	89.31
Alfred	68,617	75.47	17.82	93.29	6.94	100.23
Canton	39,857	61.00	14.32	75.32	11.97	87.29
Cobleskill	42,665	63.32	17.05	80.38	10.93	91.31
Delhi	42,680	58.79	10.96	69.75	13.33	83.08
Farmingdale	128,577	63.37	20.07	83.44	2.76	86.20
Morrisville	46,983	67.74	11.50	79.25	8.14	87.39

[1] Excludes expenditures for summer session and accessory instruction as these student credit hours are not reported in CASA.

BEST COPY AVAILABLE

The
Nelson A.
Rockefeller
Institute
of
Government

State University
of New York

411 State Street
Albany, New York 12203
(518) 443-5522
(518) 443-5788 Fax

BEST COPY AVAILABLE